

CLAIMS

What is claimed is:

1. An optical encoder disk comprising:
5 a disk;
a first region on said disk, wherein said first region increases continuously in size in a radial direction from a minimum at a first angular position to a maximum that is 360 degrees from said first angular position; and
10 a second region on said disk adjacent to said first region, wherein one of said first and second regions allows a greater amount of light to be transmitted therethrough than the other of said first and second regions.
2. The optical encoder of Claim 1 wherein said second region
15 encompasses said first region.
3. The optical encoder disk of Claim 1 further comprising:
a circular-shaped third region encompassed by said first region, wherein one of said first and third regions allows a greater amount of light to
20 be transmitted therethrough than the other of said first and third regions.
4. The optical encoder disk of Claim 3 further comprising:
a ring-shaped fourth region encompassing said second region, wherein one of said second and fourth regions allows a greater amount of
25 light to be transmitted therethrough than the other of said second and fourth regions.
5. The optical encoder disk of Claim 3 further comprising:
a fifth region on said disk encompassing said second region; and
30 a sixth region on said disk encompassing said fifth region, wherein said fifth region increases continuously in size in a radial direction from a minimum at a second angular position to a maximum that is 360 degrees from said second angular position, and wherein one of said fifth and sixth regions allows a greater amount of light to be transmitted therethrough than
35 the other of said fifth and sixth regions, said fifth and sixth regions out of phase with said first and second regions.

6. The optical encoder disk of Claim 5 wherein said first angular position and said second angular position are different.

5 7. The optical encoder disk of Claim 5 further comprising a seventh region that extends partially around said disk, said seventh region in a position that traverses said minimum and maximum of said first region, wherein said seventh region prevents light from being transmitted therethrough.

10 8. The optical encoder disk of Claim 5 further comprising a seventh region that extends partially around said disk, said seventh region in a position that traverses said minimum and maximum of said fifth region, wherein said seventh region prevents light from being transmitted
15 therethrough.

9. The optical encoder disk of Claim 1 wherein light transmitted through said disk is received at a light-sensitive device, wherein said light-sensitive device generates an output corresponding to an amount of said
20 light transmitted through said disk.

10. An optical encoder comprising:
a light source;
a light-sensitive detector; and
25 a code disk positioned between said light source and said detector, said code disk comprising a first region and a second region adjacent to said first region, wherein said first region increases continuously in size in proportion to angular disk position over a 360-degree arc, wherein one of said first and second regions allows light to be transmitted to said detector
30 and the other of said first and second regions prevents light from being transmitted to said detector, and wherein movement of said encoder disk relative to said detector exposes a different amount of said detector to light.

11. The optical encoder of Claim 10 wherein said second region
35 encompasses said first region.

12. The optical encoder of Claim 10 further comprising an electronic circuit coupled to said detector, said electronic circuit converting an output of said detector into a digital signal.

5 13. The optical encoder of Claim 10 wherein said code disk further comprises:

 a circular-shaped third region encompassed by said first region, wherein one of said first and third regions allows light to be transmitted to said detector and the other of said first and third regions prevents light from
10 being transmitted to said detector.

14. The optical encoder of Claim 13 wherein said code disk further comprises:

 a ring-shaped fourth region encompassing said second region, wherein one of said second and fourth regions allows light to be transmitted to said detector and the other of said second and fourth regions prevents light from being transmitted to said detector.
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15. The optical encoder of Claim 13 wherein said code disk further comprises:
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 a fifth region encompassing said second region; and
 a sixth region encompassing said fifth region, wherein the area of said first region increases continuously in size in proportion to angular disk position over a 360-degree arc, and wherein one of said fifth and sixth
25 regions allows light to be transmitted to said detector and the other of said fifth and sixth regions prevents light from being transmitted to said detector, said fifth and sixth regions out of phase with said first and second regions.

16. The optical encoder of Claim 15 wherein said first and second
30 regions are 180 degrees out of phase with respect to said fifth and sixth regions.

17. The optical encoder of Claim 15 wherein said code disk further comprises a seventh region that extends partially around said code disk, said seventh region in a position that traverses the minimum and maximum
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of said first region, wherein said seventh region prevents light from being to said detector.

5 18. The optical encoder of Claim 15 wherein said code disk further comprises a seventh region that extends partially around said code disk, said seventh region in a position that traverses the minimum and maximum of said fifth region, wherein said seventh region prevents light from being transmitted to said detector.

10 19. The optical encoder of Claim 15 wherein said detector comprises a first photodiode that receives light transmitted that is through said first and second regions, a second photodiode that receives light that is transmitted through said first and third regions, a third photodiode that receives light that is transmitted through said second and fourth regions, a
15 fourth photodiode that receives light that is transmitted through said fifth and sixth regions, and a fifth photodiode that receives light that is transmitted through a seventh region that extends partially around said code disk.